THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 39

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte WEI GAO and JOHN B. VANDER SANDE

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Appeal No. 96-1353
Application 07/696,973[1]

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HEARD: December 10, 1997

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Before McCANDLISH, *Senior Administrative Patent Judge*, ABRAMS and FRANKFORT, *Administrative Patent Judges.*

ABRAMS, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the decision of the examiner finally rejecting claims 1, 3 through 6, 8 through 55 and 57 through 89. Claim 2 has been withdrawn from consideration as being directed

[1] Application for patent filed May 1, 1991. According to appellants, this application is a continuation of Application 07/542,170 filed June 22, 1990, now abandoned.

to a non-elected invention, and claims 7 and 56 have been canceled. No claims have been allowed.

The appellants' invention is directed to a method for preparing an adherent superconducting oxide coating. The subject matter before us on appeal is illustrated by reference to claim 1, which reads as follows:

1. A method for preparing an adherent superconducting oxide coating comprising:

combining metallic elements of a superconducting oxide to form an alloy;

melting said alloy and maintaining said alloy in a molten state;

melt writing with said molten alloy such that said molten alloy is applied through an orifice to a surface of a substrate;

selectively varying process parameters so that the thickness and width of said molten alloy can be controlled;

moving said orifice and substrate with respect to one another so as to form a patterned precursor alloy; and

oxidizing said patterned alloy to form said adherent superconducting oxide.

THE REFERENCES

The references relied upon by the examiner to support the final rejection are:

MacKay	4,754,900	Jul. 5, 1988
Jasper, Jr. (Jasper)	4,820,688	Apr. 11, 1989
Ashok et al. (Ashok)	4,960,752	Oct. 2, 1990 (filed Feb. 27, 1989)

THE REJECTION

Claims 1, 3 through 6, 8 through 55 and 57 through 89 stand rejected under 35 U.S.C. § 103 as being unpatentable over Jasper in view of Ashok and MacKay.

The rejection is explained in the Examiner's Answer.

The opposing viewpoints of the appellants are set forth in the Brief and the Reply Brief.

OPINION

The rejection in this case is that the subject matter of the claims is obvious under 35 U.S.C. § 103. The test for obviousness is what the combined teachings of the prior art would have suggested to one of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). In establishing a *prima facie* case of obviousness under 35 U.S.C. § 103, it is incumbent upon the examiner to provide a reason why one of ordinary skill in the art would have been led to modify a prior art reference or to combine reference teachings to arrive at the claimed invention. See *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Int. 1985). To this end, the requisite motivation must stem from some teaching, suggestion or inference in the prior art as a whole or from the knowledge generally

available to one of ordinary skill in the art and not from the appellant's disclosure. See, for example, *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1052, 5 USPQ2d 1434, 1052 (Fed. Cir.), *cert. denied*, 488 U.S. 825 (1988).

Claim 1, the sole independent claim, recites a method of preparing an adherent superconducting oxide coating. The steps include combining the elements to form an alloy, melting it, depositing it on a substrate by "melt writing"[2] as the substrate is moved to create a pattern, and oxidizing the patterned substrate. The examiner's opinion is that Jasper discloses all of the claimed subject matter except for "the method as claimed by Appellant [*sic*]." However, it is his view that Ashok teaches the claimed manner of oxidizing the precursor superconducting alloy and MacKay teaches the claimed step of "melt writing," and he has taken the position that it would have been obvious to one of ordinary skill in the art to modify the Jasper method to meet the terms of claim 1 (Answer, page 3). The appellants argue that there would have been no suggestion to combine the references in

[2] Our understanding of the phrase "melt writing" is that it is the forming of a pattern upon a substrate by moving a nozzle and the substrate with respect to one another as molten material issues from the nozzle. See specification, page 2.

the manner proposed by the examiner, and that MacKay is nonanalogous art and therefore is improperly considered.

Jasper discloses a traveling wave tube in which a superconducting circuit is formed upon a substrate. Superconductor material is applied in a pattern to the substrate by the technique of plasma spraying and becomes fused to the substrate. The examiner has acknowledged that the material deposited by the plasma spraying is an oxide, which would indicate that a subsequent oxidation process is not necessary, and none is taught in this reference.

Ashok is directed to the manufacture of superconducting structures and teaches depositing a superconductor material upon a moving belt by means of an atomizer nozzle in which pressurized gas is used as a vehicle for moving a molten stream of metal. The resulting product is a continuous strip or a series of broken strips (Figures 2 and 3; column 4, lines 13 through 17). The required oxidation of the superconductor material can be accomplished either by atomizing it in an oxidizing atmosphere or oxidizing it after deposition on the moving belt (Abstract).

MacKay discloses an apparatus for dispensing liquid metals in small controlled volumes upon such items as an electronic substrate in drops (Figure 1) or in strips (Figure 4) for use in

bonding other components to the substrate. This is accomplished by placing molten metal in a capillary tube, from the nozzle of which it is deposited as the tube is moved into successive positions or along a path.

In our opinion, deficiencies exist in the examiner's rejection with regard to the suggestion to combine. Jasper uses plasma spraying because it "quickly heats a material to thousands of degrees and instantly deposits the material on a surface where it resolidifies" (column 6, lines 41 through 43) and becomes fused to the substrate. From our perspective, one of ordinary skill in the art would have appreciated that the Jasper invention thus requires that the superconductor material be a finished product when it is sprayed onto the substrate, that is, that it has been oxidized prior to spraying. This being the case, it is our view that motivation therefore would not have been present to modify the Jasper process by spraying an unoxidized superconductor material upon the substrate, and then oxidize it later. Not only would this add another step to the Jasper process, but there is no evidence to support a conclusion that the unoxidized superconductor material would perform in the manner required by the Jasper invention upon being deposited, or after a subsequent oxidation step. This undermines the

examiner's position that oxidation prior to spraying is the equivalent of oxidation subsequent to spraying.

In addition, even assuming, *arguendo*, that MacKay is analogous art, we can perceive no teaching, suggestion or incentive which would have motivated one of ordinary skill in the art to substitute the molten metal nozzle deposition technique disclosed in MacKay for the plasma spraying system of Jasper. Here, there is no evidence to support a conclusion that the application of the Jasper materials by the MacKay process would result in the objectives of the Jasper invention being met.

For the reasons expressed above, it is our conclusion that the applied references fail to establish a *prima facie* case of obviousness with respect to the subject matter recited in claim 1. This being the case, the rejection of claim 1 is not sustained nor, it follows, is the rejection of all of the other claims before us, which depend from claim 1.

The decision of the examiner is reversed.

REVERSED

HARRISON E. McCANDLISH Senior Administrative Patent Judge	
NEAL E. ABRAMS Administrative Patent Judge	BOARD OF PATENT APPEALS AND INTERFERENCES
CHARLES E. FRANKFORT Administrative Patent Judge	

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